Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

**Problem Solving Activity (The Marshmallow Challenge)**

Mrs. Krouse, Pre-AP Biology, 2015-2016

**The Challenge:** Create the tallest free-standing structure using spaghetti noodles, a marshmallow, tape and string

**Rules:**

* The structure will be measured from the table top surface or the floor (whichever you choose to build on) to the top of the marshmallow. The structure cannot be placed on a chair.
* The entire marshmallow must be on top. Cutting or eating part of the marshmallow disqualifies the team. No marshmallow will be replaced.
* The time limit is 18 minutes.
* Use as much or as little of the kit. The team can use as many or as few of the 20 spaghetti noodles, as much or as little of the string or tape. The plastic bag cannot be used as part of the structure.
* The team cannot hold on to the structure when time is called. Those touching or supporting the structure at the end of the exercise will be disqualified.

**Materials:**

* 20 dry spaghetti noodles
* 1 meter of string
* 1 marshmallow
* 1 meter of masking tape
* Pair of scissors

**Before You Begin Building:**

1. What properties (aka traits or characteristics) of the following materials will you need to consider when planning how to build your structure and WHY? Describe ONE property for each material. Please use complete sentences. *(Ex: String is flexible so it can be wrapped around other materials to hold them together.)*

|  |  |
| --- | --- |
| **Materials** | **Properties** |
| Dry spaghetti noodles |  |
| String |  |
| Marshmallow |  |
| Masking Tape |  |

1. Draw a diagram of your structural plan. Make sure to include all the materials from the chart in #1 in your diagram.

**After You Build:** Please answer the following questions using complete sentences.

1. How tall was your final structure? How did the height of your structure compare to the other structures in the classroom?
2. What about your structure worked well? Describe two good choices you made when planning / building your structure, and explain why they were good choices.
3. What about your structure would you change? List two specific changes you would make to strengthen and/or lengthen your structure.
4. The parts of the scientific method are summarized below as Steps A-D. (Note: These steps can be summarized in many different ways… just go with it!) Once you have read through the steps, identify the step that each question in this activity attempted to mimic. Also, you must provide an explanation for WHY you chose each step.
5. State a research question and do some background research
6. Make a hypothesis (a prediction) and design an experiment
7. Collect and analyze data from your experiment
8. Draw conclusions and plan improved or related experiments

|  |  |  |
| --- | --- | --- |
| **Question from the Activity** | **Step of the Scientific Method (just write letter A, B, C, or D)**  \*\*\*One letter will be used twice, and it is NOT C!\*\*\* | **Explanation for the Step You Chose** |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |

*\*\*\*This document is modified from an activity created by Lange (2012-2013)\*\*\**